Draft
Environmental Assessment
for Extension of
Special Federal Aviation Regulation 71

Federal Aviation Administration

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1. Purpose and Need for the Proposed Action

To address safety concerns regarding the air tour sightseeing industry in Hawaii, the Federal Aviation Administration (FAA) issued an emergency final rule entitled "Air Tour Operators in the State of Hawaii" as Special Federal Aviation Regulation (SFAR) 71 on September 26, 1994. The SFAR final rule was effective October 26, 1994 and is scheduled to expire on October 26, 1997. The proposed action is a rulemaking to extend the expiration date for SFAR 71 an additional three years until October 2000. This action ensures that regulatory requirements for the safe operation of air tours in the airspace over the State of Hawaii embodied in SFAR 71 remain in effect.

SFAR 71 established additional operating procedures for Hawaii air tour operators. These additional operating procedures specifically address the escalation of air tour accidents associated with the growth of the air tour sightseeing industry in Hawaii. During the nine-year period between 1982 and 1991, there were 11 air tour accidents with 24 fatalities in Hawaii. The SFAR 71 procedures included minimum safe altitudes (and associated increases in visual flight rules (VFRs) weather minimums), minimum equipment requirements, and operational limitations for air tour aircraft in the State of Hawaii. FAA concluded that the data on accidents that occurred from 1982-1991 justified these additional procedures, despite voluntary measures already established by some Hawaii air tour operators, the cooperation of Hawaii air tour operators, and an increase in FAA's inspections. The U.S. Court of Appeals for the Ninth Circuit determined that FAA had good cause for this emergency rulemaking.[1]

The need to extend the expiration date for SFAR 71 is substantiated by FAA's finding that the rule has been successful in accident prevention. Since the issuance of SFAR 71, there have been only three air tour incidents in Hawaii, all of which have involved engine failures where the vehicle landed safely and no persons were injured.

The proposed action is a safety-based rulemaking specifically applicable to the State of Hawaii. In the future, FAA plans to issue a notice of proposed rulemaking which will apply to all air tour operators in the United States, the proposed National Air Tour Standards Rule. FAA anticipates that this national rule, when finalized, will replace SFAR 71. The provisions of the national rulemaking are modeled after SFAR 71 and will impose similar requirements. After the national rulemaking is finalized, SFAR 71 would then be rescinded.

[1] Hawaii Helicopter Operators v. Federal Aviation Administration, 51 F.3d 212 (9th Cir. 1995).

2. Description of the Proposed Action and Alternatives

This section provides a description of the proposed action and alternatives. First, background information on the air tour industry in Hawaii is discussed, including a definition of scenic air tour operators, a description of the current regulatory status of Hawaii scenic air tour operators, and an overview of the number and types of Hawaii scenic tour operators. Next, a summary is provided of the proposed action, other alternatives considered and not assessed, and the no action alternative.

2.1 Background

2.1.1 Definition of Scenic Air Tour Operators

Operators providing air tour sightseeing flights range from "commercial operators," whose business operation is dedicated solely to conducting air tours, to "general aviation operators," who may conduct limited air tour flights while providing a variety of other services. General aviation operators may provide flight instruction, may provide air tours from a fixed base location, and/or may provide air tours at air shows, county fairs, or carnivals.

The SFAR 71 as originally published as a final rule defines an "air tour operator" as any person who conducts an air tour, and an "air tour" as "any sightseeing flight conducted under VFRs in an airplane or helicopter for compensation or hire."[2]

2.1.2 Current Regulatory Status of Hawaii Scenic Air Tour Industry

The FAA regulates commercial aircraft operations under two major sets of operating requirements, based on the size of the aircraft and the type of operation, entitled the Part 121 and Part 135 requirements. Part 121 and Part 135 operators must also comply with the certification requirements in 14 CFR Part 119.

Currently, section 119.1(e) (2) exempts certain nonstop sightseeing flights from the 14 CFR Part 119 certification requirements and from the requirements of either Part 121 or Part 135 if: (1) the flights begin and end at the same airport; and (2) the flights are conducted within a 25 statute mile radius of that airport. These exempted air tour operations are currently conducted under Part 91, which has less stringent requirements than those contained in either Part 135 or Part 121. For example, Part 135 operators must meet time-and-duty limitations on flight crews, while Part 91 operators do not, and Part 135 includes more demanding maintenance regulations as compared to Part 91.[3]

The majority of air tour operations in Hawaii are currently conducted under Part 135 of the FAR, although some air tours are conducted under Part 91. SFAR 71 applies to all airplane

[2] Federal Aviation Administration, Department of Transportation. Air Tour Operators in the State of Hawaii. Final rule; request for comments. September 26, 1994.
[3] Safety Analysis Branch, Office of Accident Investigation, Federal Aviation Administration, Department of Transportation. Accidents Involving Part 91 and Part 135 Air Tour Operators: 1998-1995. October 7, 1996. p. 1.

and helicopter VFR air tour flights within the State of Hawaii operating under the provisions of 14 CFR Parts 91 and 135. SFAR 71 provides specific procedural, operational, and equipment requirements beyond those required under 14 CFR Parts 91 and 135. The additional requirements imposed by SFAR 71 on Hawaii air tour operators are detailed in Section 2.2, the Description of the Proposed Action.

2.1.3 Overview of the Hawaii Scenic Air Tour Industry

Hawaii has an active scenic air tour industry that carries about 400,000 passengers annually. Twenty-four operators conduct air tours under Part 135, using 77 aircraft. Of these 77 aircraft, 18 are airplanes and 59 are helicopters. It is estimated that ten operators conduct air tours under part 91, using 14 aircraft, of which eight are airplanes and six are helicopters.

Since 1980, the air tour industry in the State of Hawaii has grown rapidly, particularly on the islands of Oahu, Kauai, Maui, and Hawaii. In 1982, there were approximately 63,000 helicopter and 11,000 airplane tour flights. By 1991, these numbers had increased to approximately 101,000 for helicopters and 18,000 for airplanes. After a slight decline due to Hurricane Iniki in 1992, air tour flights in 1994 were projected to reach 1991 levels.[4]

Exhibit 2-1 summarizes in tabular format typical scenic tour destinations by island. Exhibit 2-2 provides a map of the locations of airports and landing strips that have been confirmed to be used by scenic tour operators.

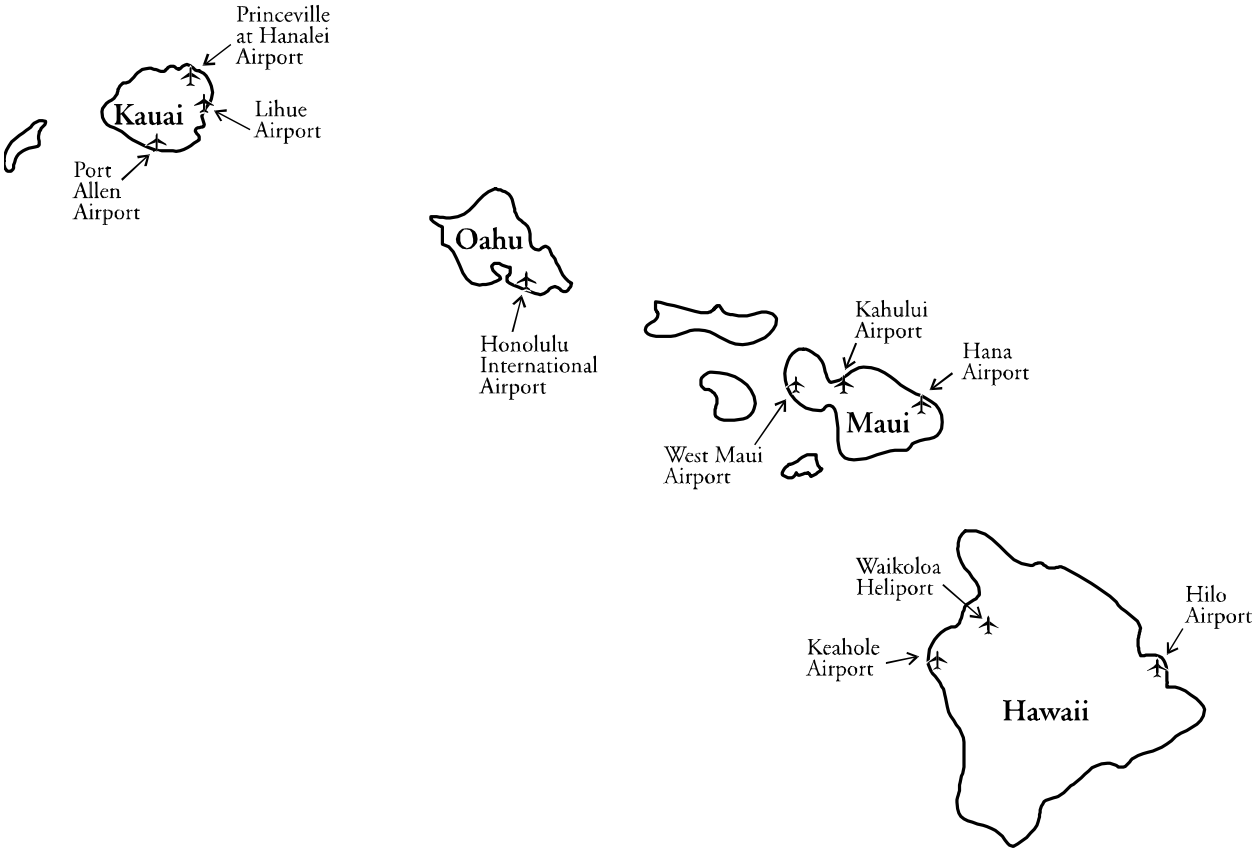
Exhibit 2-1
Air Tour Destinations

Island	Airport(s)	Possible Destinations
Kauai	Lihue Airport, Princeville at Hanalei Airport (heliport), Port Allen Airport (heliport)	Waimea Canyon Na Pali Coast Waialeale Crater Waimea Canyon Hoary Head Mountain Range Hanpepe Valley Manawaiopuna Falls Olokele Canyon Waialae Falls Koke'e State Park Hanalei Bay Lumahai Beach Namolokama Mountain Kawailewa Falls Hanalei Valley Wailua Falls
Maui	Kahului Airport, West Maui Airport, Hana Airport	Haleakala Crater "House of the Sun" Hana forest Seven Sacred Pools North Shore

[4] Federal Aviation Administration, Department of Transportation. Air Tour Operators in the State of Hawaii. Notice of Proposed Rulemaking; disposition of comments (DRAFT).

		West Maui Mountains Iao Needle Waihee Valley “Wall of Tears” Lahaina Molokini Molokai Lanai Kahoolawa
Oahu	Honolulu International Airport	Waikiki Diamond Head Pearl Harbor Hanuma Bay Makapuw Point Pali Pass Chinaman’s Hat Sacred Falls North Shore Sunset Beach Pipeline Beach Waimea Beach
Hawaii	Hilo Airport, Keahole Airport, Waikoloa Heliport	Pu’u Vent Rainbow Falls Akaka Falls Pu’u O’o Vent Waimanu Waipio Pololu Kona Kailua Bay Keauhou Bay Kealakekua Bay Pu’uhonua O Hanaunau Hapuna Beach Hilo Bay Pepe’ekeo Point Laupahoehoe Hamakua Cliffs Kolekole Valley

Exhibit 2-2
Locations of Hawaiian Island Airports



2.2 Description of the Proposed Action

The FAA is proposing a rulemaking to extend the expiration date for SFAR 71 until October 2000. This action will ensure that SFAR 71 regulatory requirements for the safe operation of air tours in the airspace over the State of Hawaii remain in effect. These requirements include:

- Requirement that any single engine air tour helicopter flown beyond the shore of any island must be amphibious or equipped with emergency floats and approved flotation gear easily accessible for each occupant, or that each person on board the helicopter wear approved flotation gear.

- Requirement that, before departure, the air tour operator must complete a performance plan for the helicopter flight. The pilot in command (PIC) must comply with the performance plan. The plan must be based on information in the rotorcraft flight manual (RFM). It must consider the maximum density altitude to which the operation is planned, as well as such elements as maximum gross weight and center of gravity, maximum gross weight for hovering in or out of ground effect, and maximum combination of weight, altitude, and temperature for which height-velocity information in the RFM is valid.

- Requirement that the PIC operate the helicopter at a combination of height and forward speed (including hover) that would permit a safe landing in the event of engine power loss, in accordance with the height-velocity envelope for that helicopter under current weight and aircraft altitude.

- Requirement that, unless operating in compliance with an air traffic control clearance, or as otherwise authorized by the FAA Administrator, air tour operations may not be conducted below an altitude of 1,500 feet from any person or property; or below any altitude provided by Federal statute or regulation; or closer than 1,500 feet to any person or property.

- Requirement that passengers be briefed (in addition to § 91.102 and § 135.117) before takeoff for an air tour flight with a flight segment beyond the ocean shore of any island. This briefing shall include information on water ditching procedures, the use of personal flotation gear, and emergency egress from the aircraft. The PIC must orally brief passengers, distribute written instructions, or ensure that passengers have been briefed on emergency procedures.

Regarding the minimum operating altitude requirement, FAA has allowed deviations from SFAR 71 for specific air tour operators on a case-by-case basis. Starting in 1994, air tour operators of fixed-wing aircraft have been granted deviations to conduct air tours at a minimum altitude of 1,000 feet, and air tour operators of single-engine helicopters have been granted deviations to conduct air tours at a minimum of 500 feet. The FAA has provided an equivalent level of safety to that of the higher altitude restriction by requiring additional safety measures of the air tour operators that are granted deviations.[5]

The proposed action is not expected to have any impact on the number of scenic tour operators in Hawaii or the type or number of scenic flights conducted. This is because the proposed action is a continuation of the existing level of safety and related regulatory requirements.

2.3 Alternatives Considered But Not Assessed

FAA also considered alternatives including a permanent implementation of SFAR 71, SFAR 71 without deviations, a one-year SFAR 71, a temporary ban on air tour operations at all sites, or a permanent ban, as discussed below.

FAA considered permanently implementing SFAR 71. This alternative was rejected in light of the expected proposal of the National Air Tour Standards Rule. Permanently implementing SFAR 71 would leave open the possibility of inconsistency regarding Hawaiian air tour operators versus air tour operators in the rest of the country.

FAA considered implementing SFAR 71 without deviations. This alternative was rejected based on the FAA's learned experience with SFAR 71 that deviations can be permitted with an increase in safety.

[5] *Ibid*

FAA could only impose a temporary or permanent ban on air tour operations if a significant safety consideration existed. Therefore, this alternative was rejected as beyond FAA's regulatory mandate.

2.4 The No Action Alternative

The no action alternative consists of allowing SFAR 71 to expire on October 26, 1997 as originally promulgated. This alternative would result in the end of special requirements for the safe operation of air tours in the airspace over the State of Hawaii. The no action alternative may result in an increase in the number of air tour accidents in Hawaii, as seen prior to the effective date of the SFAR 71 requirements, depending on the extent to which air tour operators take advantage of reduced restrictions to conduct riskier flights.

3. Affected Environment

This section describes the affected environment of this proposed action, the Hawaiian Islands. The following areas are discussed: air; water; soil; biological resources; noise; aesthetics; religious, historical, and archeological resources; and socioeconomics. Because the proposed action studied in this draft EA is applicable to the entire State of Hawaii and not a specific location or locations on the islands, only a broad overview of the affected environment of the islands is presented.

The Hawaiian Islands are located nearly in the middle of the Pacific Ocean, and the islands are the exposed tops of a chain of enormous volcanoes. The entire Hawaiian Archipelago extends 2,050 miles from the Island of Hawaii to the Kure Atoll. The entire archipelago, except for the military base of Midway Island, is part of the State of Hawaii. The archipelago includes the islands of Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii. Hawaii is the southernmost state in the United States, at 20 degrees above the equator.

3.1 Air Environment

The State of Hawaii and the U.S. Environmental Protection Agency regulate air pollutant emissions in the State of Hawaii. This proposed rulemaking is an air traffic action that is presumed to be *de minimus* under the Clean Air Act and its implementing regulations.

The air quality in the State of Hawaii is generally good. All of the state is classified as in attainment for the six primary pollutants identified in the Clean Air Act Amendments of 1990: carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, lead, and particulate matter 10 microns or less. Thus, the U.S. Environmental Protection Agency has determined that air pollution levels of these pollutants do not persistently exceed established unhealthful levels.[6]

Hawaii does experience air quality issues related to its volcanoes. Active volcanoes produce emissions largely composed of water vapor, as well as smaller amounts of sulfur dioxide, carbon dioxide, and hydrogen. Carbon monoxide, hydrogen sulfide, and hydrogen fluoride are also released, but typically represent less than one percent of the volcanic emissions by volume. These gaseous emissions pose the greatest hazard in the immediate vicinity of the vent, where the concentrations are the greatest. Away from the vent, the gases quickly become diluted by air. However, the continuous eruption at Kilauea on the island of Hawaii is producing an air quality problem removed from the site of the vent. This eruption is very quiet, with lava flowing through lava tubes to the ocean. At the vent, there is an almost constant plume of volcanic fume that contains significant amounts of sulfur dioxide. This sulfur dioxide combines with water in the atmosphere to form sulfuric acid droplets, which are carried in the trade winds around to the leeward side of the island. This region of the state has been affected by this air quality problem since the eruption began in 1983.[7] However, it does not appear that these emissions meet the criteria for persistently exceeding the National Ambient Air Quality Standard for sulfur dioxide.

[6] Internet reference. Information found at: http://www.epa.gov/airs/nonattn.html on August 7, 1997.
[7] Internet reference. Information found at http://volcano.und.nodak.edu/vwdocs/frequent_questions/top_101/Effects/Effects1.html on August 7, 1997.

Due to its nearly equatorial latitude, the sun is almost directly overhead of the Hawaiian Islands all year round. In addition, the moderating influence of the Pacific Ocean helps to keep temperatures stable year round. The Island of Hawaii has most of the different climate types on the surface of the earth. Tropical rain forests are found on the northeast windward side (the side facing the trade winds), which receives 200 inches of precipitation. Arid desert vegetation typifies portions of the rain shadow western side of the island, where less than five inches of rain fall per year. Altitudinal zonation creates a variety of different climatic and vegetative environments on the sides of Mauna Kea and Mauna Loa, with near tundra-like conditions at the peaks where violent snow and ice storms can occur. Honolulu, on the island of Oahu, has an average January temperature of 72 degrees F, which is only six degrees cooler than its average July temperature of 78 degrees F. Northeasterly trade winds dominate over the Hawaiian island chain and further south, while westerlies are found further north. The annual average trade wind speed is six m/s (13.5 mph) at 20 degrees north latitude.

Hawaii lies in between the tracks of the north Pacific storms moving from west to east, and the equatorial hurricanes moving from east to west. Occasionally in the winter months a north Pacific storm will migrate as far south as Hawaii, bringing considerable rain, especially to the northeast windward sides of the islands. Tropical hurricanes have also migrated toward Hawaii in the summer months, but rarely have they actually hit the islands. The major exception this century, however, was Hurricane Iniki which devastated the island of Kauai in 1992.

3.2 Water Environment

Hawaii's volcanic origins play a large role in determining the islands' hydrology. The basaltic lava flows, which comprise much of the archipelago, are porous and highly permeable, serving as aquifers for groundwater. In rift zones, the flow of water is interrupted by dikes formed by the intrusion of dense, impermeable molten lava. Dikes are generally found at higher elevations, and tend to impound rain water that falls at 60 to 90 meters above sea level. Impounded water is discharged in springs or streams.

Of vital importance in the maintenance of the islands' freshwater system is the role of Hawaii's forests. Forested mountain watersheds are the primary source of water for the islands urban, industrial, and agricultural areas.[8] Fresh water accumulates in basaltic flows and forms large underground lens-shaped bodies. Fresh water lenses float above oceanic salt water, which formed the original lenses. Lenses are recharged by rain water and discharges of impounded water. Caprock prevents the seaward discharge of groundwater and causes the lenses in these areas to thicken to as much as 250 to 312 meters. Discharge from these lenses takes the form of artesian springs at six to eight meters above sea level. In regions where the permeability of the basalt is unhampered by caprock, the lenses are as thin as 15 to 20 meters, and there is no formation of springs.[9]

Surface water tends to run in short, steep stream channels with small watershed areas. Most are perennial, and those in mountainous areas are regularly recharged by daily precipitation or discharge from impounded water. Streams in lowland areas lose some water through channel

[8] Hawaii Tropical Forest Recovery Task Force. 1994. Hawaii Tropical Forest Recovery Action Plan. July 1994.

[9] Department of Geography, University of Hawaii. *Atlas of Hawaii*, 2nd Edition. University of Hawaii Press (Honolulu, 1983), p. 48.

infiltration. Most streams have a steady but small average discharge of less than 50 million gallons per day. Only two rivers, the Wailuku River on Hawaii and the Hanalei River on Kauai, have average discharges reaching greater than 150 million gallons per day. Because stream beds have little storage capacity, at times of heavy rain flash floods are common occurrences.[10]

Agricultural enterprises, primarily sugarcane irrigation, constitute a large portion of Hawaii's water usage. The demand for potable water for municipal use is increasing on Oahu and in parts of Maui. Oahu's water is drawn primarily from its groundwater resources, though surface water is used as an alternative where aquifers are currently at full exploitation. On Maui and Kauai there is less reliance on groundwater resources to meet water usage demands. In-stream uses of water on all islands include hydroelectric power generation, recreational use, and maintenance of aquatic life. There are not a significant number of navigable fresh water channels. Water usage is a significant concern on the island of Oahu.[11]

Hawaii's oceanic waters constitute an additional important resource for the islands. Ocean currents are governed by the northeasterly trade winds, as are the dominant waves. Currents, waves, salinity, and sea temperature vary moderately with the seasons. Nearer the islands, local variations affect surface currents and waves. Tsunami waves are rare, but can occur.

Coastal Zone Management. The Coastal Zone Management Act of 1972 (Public Law 92-583) states that the national policy is to preserve, protect, develop, restore, and/or enhance the resources of the nation's coastal zone. The Act defines "coastal zone" as extending inland from the shoreline only to the extent necessary to control shorelands. The Act requires Federal agencies which conduct or support activities that directly affect the coastal zone to conduct these activities, to the maximum extent possible, in a manner consistent with approved state coastal zone management programs. The FAA has determined that this proposed action is consistent "to the maximum extent practicable" with the coastal policies and objectives of the State of Hawaii.

"Class AA Water Areas" in the State of Hawaii are afforded the greatest degree of protection. On the Island of Hawaii, Class AA waters are Puako Bay, Waiulua Bay, Anaehoomalu Bay, Kiholo Bay, Kailua Harbor, Kealakekua Bay, Honaunau Bay. On Oahu, Class AA waters are Waialua Bay, Kahana Bay, Kaneohe Bay, and Hanauma Bay. On Kauai, Hanalei Bay is a Class AA Water. Class AA waters also include: (1) all embayments in preserves, reserves, sanctuaries, and refuges established by the Hawaii Department of Land and Natural Resources under Chapter 195 or Chapter 190, HRS, or similar reserves for the protection of marine life established under Chapter 190, HRS; (2) all waters in state or federal fish and wildlife refuges and marine sanctuaries; and (3) all waters which have been officially identified as a unique or critical habitat for threatened or endangered species.

"Class A Water Areas" in the State of Hawaii are: (1) Hilo Bay (inside breakwater), Kawaihae Boat Harbor, Honokohau Boat Harbor, Keauhou Bay, on the Island of Hawaii; (2) Kahului Bay, Lahaina Boat Harbor, and Maalaea Boat Harbor, on Kaiui; (3) on Lanai, Manele Boat Harbor and Kaumalapau Harbor; (4) on Molokai, Hale o Lono Harbor, Kaunakakai Harbor, and Kaunakakai Boat Harbor; (5) on Oahu, Kaiaka Bay, Paiko Peninsula to Koko Head, Ala Wai Boat Harbor, Kewalo Basin, Honolulu Harbor, Keehi Lagoon, Barbers Point Harbor, Pokai Bay, Heeia Kea Boat Harbor, Waianae Boat Harbor, Haleiwa Boat Harbor, and Ko Olina; (6) on

[10] *Ibid.* p. 48.
[11] *Ibid.* p. 50.

Kauai, Hanamaulu Bay, Nawiliwili Bay, Kukuiula Bay, Wahiawa Bay, Hanapepe Bay (inside breakwater), Kikiaola Boat Harbor, and Port Allen Boat Harbor; and (7) embayments meeting specific criteria.[12]

This draft EA will be submitted to the State of Hawaii's Department of Business, Economic Development & Tourism, which has authority over ocean and coastal management issues, for consistency review.

Wild and Scenic Rivers. The Wild and Scenic Rivers Act, 16 U.S.C. 1274 et seq., establishes requirements applicable to water resource projects affecting wild, scenic or recreational rivers within the National Wild and Scenic Rivers system as well as rivers designated on the National Rivers Inventory to be studied for inclusion in the national system. Under the Act, a Federal agency may not assist, through grant, loan, license or otherwise, the construction of a water resources project that would have a direct and adverse effect on the values for which a river in the National System or study river on the National Rivers Inventory was established, as determined by the Secretary of the Interior for rivers under the jurisdiction of the Department of Agriculture. There are no rivers designated as wild and scenic in the State of Hawaii.

3.3 Soil Environment

The soil classification system devised by the Soil Conservation Service divides soil into ten orders. Hawaii is the only state in which all ten are present. Two orders comprise nearly 40% of the area of the state, Inceptisols and Histosols, largely confined to Hawaii. Inceptisols are presents on the thin mantle of volcanic ash found on Hawaii and East Maui. Histosols are thin layers of organic material which have accumulated on young, forested, lava land. Nearly half the land area in Hawaii is classified as "miscellaneous land types," covered in lava or cinders, rough mountainous land, coral outcroppings, beaches, or landfill. The remaining 15% of land contains the other eight soil orders. Some characteristics which determine soil type in Hawaii are the age of the island, the altitude of the location, and the aridity of the area.[13]

On older islands, notably Kauai and Oahu, the coastal edges of mountains are covered by alluvial and marine sediments known as caprock. Ocean-formed beaches are one of Hawaii's most valuable resources. Beaches are larger on older islands and on coasts exposed to the North Pacific swell. The oceans also provide precious coral and ferromanganese deposits.[14]

3.4 Biological Resources

For millions of years the Hawaiian islands were essentially barren; today they are home to some of the most diverse biotic communities on the planet.[15] There are 150 different recognized ecosystems in the State of Hawaii. Because of the isolation of the Hawaiian islands, migrants to the islands evolved, often in divergent ways, and the original colonizing species might have several indigenous or endemic species present on the islands today. Because so many Hawaiian species

[12] State of Hawaii, Title 11, Chapter 54. October 29, 1992. Section 11-54-06: Uses and Specific Criteria Applicable to Marine Waters.
[13] Department of Geography, University of Hawaii. *Atlas of Hawaii*, 2nd Edition. University of Hawaii Press (Honolulu, 1983), pp. 45-47.
[14] *Ibid.* p. 53.
[15] Internet reference. Information found at: www.book.uci.edu/Books/Moon/flora.html on July 17, 1997.

are highly specialized, populations are small, and many of Hawaii's plants and animals are listed as threatened or endangered species by the U.S. Fish and Wildlife Service. A recent survey records approximately 22,056 separate species on the Hawaiian islands and in the surrounding waters. Of these, 8,850 are endemic to the Hawaiian islands.[16] Remote oceanic island systems like that of the State of Hawaii are more vulnerable to ecological invasion through the introduction of exotic plant and animal species than other landmasses.

Forests. Hawaii has the eleventh largest state-owned forest and natural reserved system (i.e., 700,000 acres) in the United States. This is augmented by a similar acreage of forest land in private ownership, and an additional 150,000 acres within Federal jurisdiction (e.g., national parks, national wildlife refuges, and military training areas). Water is one of the most important products of the forest reserves, but the forests also provide habitats for an immense number of species, opportunities for nature tourism, the ability to recycle sewage effluent, and the capacity to mitigate global warming through carbon storage.[17] Researchers readily admit they do not understand all of the biological intricacies of the Hawaiian forest.[18]

Plant Communities. There are over 1,000 endemic species of plants in Hawaii, and over 2,500 species which grow on the islands.[19] Most of these plants have evolved from 275 species of natural immigrants, of which approximately 80% are of Indo-Pacific origins. A smaller portion originated in the Americas.[20] Some plant families found in Hawaii display features not found in populations in other areas of the world. Woody violets, lobelias, plantains, amaranths, and chenopods are an example of plants which have a woody habit in Hawaii but nowhere else. Other unusual plants include the giant herb known as the apeape, which has circular leaves up to 2 meters in diameter. Over 270 taxa of plants are considered endangered or threatened. Among these are silverswords, ferns, and hahas.[21]

Hawaii's plant communities are largely determined by two factors, altitude and rainfall. At lower and dryer locations communities of grasses and lowland shrubs are found; in areas with higher precipitation koa-ohia and fern forests grow. At higher elevations with high precipitation, vegetation zones include the ohia lehua rainforest, and the open koa forest. At high elevations with less rainfall, forests are dominated by the mamane plants, and in the highest locations there are alpine desert environments in which the silversword grows.[22]

Land Mammals. Hawaii has few native species of land mammals. Most of the mammals found on the island today have arrived since European rediscovery of the islands. Of 44 mammal

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[16] Internet reference. Information found at: www.bishop.hawaii.org/bishop/HBS/hispp.html on July 17, 1997.
[17] Hawaii Tropical Forest Recovery Task Force. 1994. Hawaii Tropical Forest Recovery Action Plan. July 1994.
[18] Royte, Elizabeth. 1995. "On the Brink: Hawaii's Vanishing Species." National Geographic. September, 1995, pp. 9-37.
[19] Internet reference. Information found at: www.bishop.hawaii.org/bishop/HBS/hispp.html on July 17, 1997.
[20] Department of Geography, University of Hawaii. *Atlas of Hawaii*, 2nd Edition. University of Hawaii Press (Honolulu, 1983). p 69.
[21] Internet reference. Information found at: www.bishop.hawaii.org/bishop/HBS/hispp.html on July 17, 1997.
[22] Department of Geography, University of Hawaii. *Atlas of Hawaii*, 2nd Edition. University of Hawaii Press (Honolulu, 1983). p 70.

species which inhabit the islands, two are endangered: the hoary bat and the monk seal. The principal breeding population of the hoary bat is on the Island of Hawaii, but another exists on Kauai. Monk seals avoid the main islands entirely, with populations concentrated primarily in the northwestern islands from French Frigate Shoals to Kure Atoll.[23]

Birds. Hawaii's bird population is considered particularly diverse. There are a total of nearly 300 bird species in Hawaii, and 60 are found only on the islands.[24] There are 32 species of endangered birds which can be found in Hawaii, and it is estimated that 44 taxa have become extinct since man first inhabited the islands.[25] Hawaiian species comprise over half the list of threatened and endangered bird species.[26] The high forests have the greatest diversity of avian life, but there is also a great variety of seabirds, especially on Laysan Island to the northwest.

Major indirect stresses on bird populations are browsing and rooting by ungulates (primarily goats, pits, cattle, and axis deer), and the invasion of the forest by a wide variety of introduced plants. For example, on Maui, goats and cattle are eliminating the last vestiges of koa forest on the south slopes of Haleakala, and goats also inhabit the Manawainui Planeze and are moving steadily eastward. The combined impact of feral mammals and exotic plants greatly disrupts the native forests, changing species composition, distribution, and densities, and these changes correspondingly effect the distribution and abundance of native and exotic birds.[27] Native endangered and threatened nesting forest birds may be negatively impacted by scenic tour operations by being continuously flushed from their habitats by the disruption of air tours.

The following bullets describe the range of endangered and threatened bird species on the Hawaiian islands.

- Of the three species of seabird found only on the main islands, two are endangered: Townsend's shearwater and the dark rumped petrel. The shearwater's last breeding colony is located on Kauai. The population is facing difficulty due to the island's increasing urbanization and the species' difficulty with urban and resort lighting. The dark-rumped petrel nests primarily above 2,500 meters within Haleakala National Park on Maui, with some small colonies on the upper slopes of the other main islands.[28]

- There are only five species of waterfowl which nest in Hawaii, and three are endangered. The Hawaiian duck or koloa nest on Kauai, which is free of its predator, the mongoose. The Laysan duck is found only on island of Laysan. The Hawaiian goose, or nene, is the state bird of Hawaii. This flightless bird lives on Maui and Hawaii. The lowland areas it prefers to inhabit have been greatly modified, so it has been forced to live in more marginal habitats at higher elevations. Another endangered Hawaiian species is the native Hawaiian goose, or

[23] Ibid p. 73; and Internet reference, found at: www.bishop.hawaii.org/bishop/HBS/hispp.html on July 17, 1997.
[24] Internet reference, found at: www.bishop.hawaii.org/bishop/HBS/hispp.html on July 17, 1997.
[25] Scott, J. Michael, Cameron Kepler, Charles van Riper III and Stewart I. Fefer. "Conservation of Hawaii's Vanishing Avifauna." *Bioscience.* vol 38, no 4. pp. 238-253.
[26] Department of Geography, University of Hawaii. *Atlas of Hawaii*, 2nd Edition. University of Hawaii Press (Honolulu, 1983). p. 77.
[27] U.S. Fish and Wildlife Service. 1984. Maui-Molokai Forest Birds Recovery Plan. May, 1984.
[28] *Ibid.*

Nene. Nene now tend to concentrate in a few places, such as the Haleakala National Park, Volcanoes National Park, and golf courses and neighborhoods.[29] The Nene and other ground-nesting birds are preyed upon by imported mongoose and rats, and may be further disturbed by scenic airplane and helitours.

- Of the eleven rail species present in the islands before human habitation, only two survive today, and both are endangered. The moorhen and the coot inhabit wetland areas on Kauai and Oahu. Another family of birds which inhabits wetlands is the stilt. The only member of this family which is found in Hawaii is the endangered black-necked stilt.

- There are many families of endangered perching birds in Hawaii. Among the family with the largest number are the Hawaiian honeycreepers, which once consisted of 47 species and is considered a model of adaptive radiation among birds. Today, 20 species survive, but fifteen species have highly specialized habitat needs and small populations. Some species live on many of the islands; others, such as the poo-uli, live only in a very specific area. Another endangered perching bird is the elepaio, which is found on Hawaii, Oahu, and Kauai.

- The palila is a finch-billed member of the endemic Hawaiian honeycreeper sub-family. It is endangered and historically has only been known on the Island of Hawaii, occurring in the dry mamane-naio forests on the upper slopes of Mauna Kea, the northwest slopes of Mauna Loa, and the eastern slopes of Hualalai. Reduction in the extent and vigor of the mamane forest appears to be the major factor that has indirectly limited the distribution of palila.[30]

- There are four forest bird species of concern on the Island of Hawaii: the Hawaii Creeper, the Hawaii Akepa, the ‘Akiapola’Au, and the ‘O’u. Historically, these four species were once more common, and were found over a wider geographical area. The biggest threat today to the continuing survival of the Hawaiian forest birds is the destruction and severe disruption of their habitat as a result of logging, grazing by domestic stock, conversion of forest to agricultural uses, grazing and browsing by feral animals, and destruction of native forests by exotic plants.[31]

- There are six endangered forest birds on Kauai: O’o, O’u, Large and Small Kaua’i Thrush, Kauai Nuku-pu’u, and Kauai ‘Akialoa. Populations of all these birds are extremely low, and immediate and extreme efforts would be needed to prevent extinction. Disease and parasites, elimination and degradation of habitat, predation, competition, and overspecialization and impoverishment of the gene pool have contributed to their decline. These six endangered birds on Kaua'i are now restricted in range to Wainiha Pai, southern Alaka'i Swamp and immediately north of Koai'e Stream.[32]

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[29] U.S. Fish and Wildlife Service. 1997. Regional News and Recovery Updates. Endangered Species Bulletin, May/June 1997, vol. 12, no. 3, p. 20.
[30] U.S. Fish and Wildlife Service. 1986. Palila Recovery Plan. January, 1986.
[31] U.S. Fish and Wildlife Service. 1983. Hawaii Forest Bird Recovery Plan. February 1983.
[32] U.S. Fish and Wildlife Service. 1984. Kauai Forest Birds Recovery Plan. July, 1983.

- There are seven threatened and endangered Maui-Molokai forest birds (i.e., the Maui parrotbill, nukupuu, Maui akepa, crested honeycreeper, poo-uli, Hawaiian (Molokai) thrust, and Mokokai creeper). Sources of stress on these birds during mating, nesting, incubation, and fledging need to be avoided. The U.S. Fish and Wildlife Service Recovery Plan for these birds recommends further studies in this area.[33]

- The Alala, or Hawaiian Crow, is now found primarily in three well-defined mid-elevational areas in Kona as well as the Ka'u Forest Reserve. The U.S. Fish and Wildlife Service has documented nest abandonment as a result of human intrusion for these birds.[34]

- The ‘Io, or Hawaiian Hawk, are a wide-ranging species that prefer windward over leeward forests, and elevations from sea level to 8,500 feet. ‘Io avoid saddles and gaps between mountains. The Recovery Plan for this bird discusses the impact of harassment leading to nest abandonment and premature fledging on this species.[35]

Insects. The Hawaiian islands also support an enormous variety of unique insect life. Of the 10,000 species believed to exist there, 98% are endemic.[36] The Hawaiian drosophild species are especially rich in number, and the flies exhibit many unusual modifications which are often the subject of scientific study.

Aquatic Life. The waters off the shores of Hawaii support a large number of biotic communities. In the deep waters, tuna and mahimahi are among the pelagic fishes which may be found in the open sea, and at depths of 100 meters or greater, precious corals grow. In the shallow waters closer to shore, about 700 species of fish, 400 seaweeds, and 1,000 mollusks comprise a diverse reef community. The northwestern islands support the largest and most complex coral reefs, but Oahu and Maui are partially ringed by fringing, and Hawaii has extensively developed reefs off the Kona coast.

3.5 Noise Environment

The background noise environment in scenic areas is comprised of natural sounds, including wind, rain, surf, volcanic activity, waterfalls, and biological activity (e.g., bird life). Background noise levels are higher along the shoreline, where the dominant noise is surf, than noise levels in more remote interior areas of the island.

In addition to scenic tour operations, human contributions to the noise background include other air flight activities. Some studies have been completed in Hawaii regarding the effects of helicopter noise on rural residents away from airports and heliports. The main objective of this study was the identification of the perceptions of residents with regard to helicopter operations, with a special focus on tour operations. This study found that an annoyance problem currently already exists in Hawaii but that this problem is geographically narrow (e.g., along broad corridors

[33] U.S. Fish and Wildlife Service. 1984. Maui-Molokai Forest Birds Recovery Plan. May 1984.
[34] U.S. Fish and Wildlife Service. 1982. Alala Recovery Plan. August 1982.
[35] U.S. Fish and Wildlife Service. 1984. Hawaiian Hawk Recovery Plan. May 1984.
[36] Department of Geography, University of Hawaii. *Atlas of Hawaii*, 2nd Edition. University of Hawaii Press (Honolulu, 1983), p. 80.

connecting airports with sightseeing destinations). A concern is that many Hawaiians do not have windows or heavy insulation in their homes, so noise can penetrate very easily into residences. Some of this annoyance factor is related to flights conducted by the Drug Enforcement Agency (DEA); respondents to the above survey noted that they perceive DEA flights as causing major noise disturbances, as well as feelings of invasion of privacy. In contrast, most respondents agreed on the positive impacts of tour helicopters on the local economy and in emergency situations.

3.6 Aesthetic Environment

For the Island of Hawaii, the major tourist attractions are: (1) Akaka Falls, north of Hilo, which plunges over 420 feet in a sheer drop over a volcanic cliff; (2) Hawaii Volcanoes National Park, which has an array of unique volcanic formations, forests of giant tree ferns, steaming craters, and a volcanological museum; and (3) Maunau Kea, an active volcano which may be climbed in a four-wheeled vehicle. For Oahu, there is Hanauma Bay, a sea cove in Koko Head Park, which was created by volcanic action 10,000 years ago. Also in Oahu, tourists visit Pearl Harbor and Waimea Falls Park, a narrow canyon extending into the Koolau mountains that has an unspoiled environment of tropical plant life, birds, hiking trails, and a waterfall. Haleakala National Park includes the Haleakala Volcano and is another popular site in Maui; from the volcano crater's top-most rim to its floor is a drop of 3,000 feet. The outer wall of the volcano, cut by ravines and gullies, slopes down to the shore of the island. Additional scenic areas are the Hana Coast on Maui and Mauna Loa. Near-shore reef systems and tide-washed bays nurture additional game fish species and support an isolated food chain attractive to larger pelagic game fish. Earlier in this document, Exhibit 2-1 listed possible scenic tour destinations by island

3.7 Cultural, Historical, and Archeological Resources

Section 106 of the Historic Preservation Act of 1966 [16 USC 470(f) et seq.] requires that Federal agencies with jurisdiction over a Federal action provide the Advisory Council on Historic Preservation and the State Historic Preservation Officer (SHPO) with an opportunity to comment on the effects that an action may have on properties included in, or eligible for inclusion in, the National Register of Historic Places. This draft EA will be provided to the Hawaiian SHPO for comment.

As emphasized in the beginning of this chapter, because the proposed action studied in this draft EA is applicable to the entire State of Hawaii and not a specific location or locations on the islands, only a general characterization of the rich cultural, historical, and archeological resources of the islands are discussed briefly in this section.

Hawaiians vary culturally by island. Traditional Hawaiian belief systems as well as many world religions are practiced in the Hawaiian islands. A majority of the population follows one of the Protestant churches, but there are a substantial number of Buddhist congregations in the islands as well. Other Asian religions such as Hinduism and Shinto have small congregations throughout the islands.

The traditional context of Native Hawaiian religion is that the gods manifest themselves animistically in the natural environment, thus winds in the atmosphere, volcanic features, and waterfalls carry spiritual value for Native Hawaiians. For example, South Point (the southernmost

point of the Island of Hawaii) is sacred to Hawaiians, filled with a sense of mana, or power.[37] Sections of Hawaiian forests are designated as *wao akua,* dominion of the gods, and other sections are *kanaka,* dominion of man, each having different activities, function, and growth. Hawaiians recognize and respect a divine spirit in all things.[38] Generally, the higher up one goes in the atmosphere the more sacred a place is considered. Thus, volcanoes are very sacred because they send material up to the heavens. The Island of Hawaii supports one of the last living cults associated with the god Pele, and many families on the Island are named as direct descendants of this god.

Native flora and fauna are considered important to the Native Hawaiians for cultural and spiritual, as well as economic, reasons. Practice of the Native Hawaiian religion may occur anywhere in the natural environment. For example, hula school members or traditional herbalists collecting in the forests are practicing their beliefs. Undisturbed access to and privacy in sacred places is paramount.[39] Pigs are an example of an important animal to Hawaiian spiritual life; they are essential to traditional ceremonies such as marking the birth of a child, the building of a canoe, or graduating from hula school.[40]

There is no centralized political organization like a tribal council with a tribal chairperson for native Hawaiians. Each island has its own set of clans or families. Only in the past few hundred years were the clans in Hawaii unified. The king of Hawaii unified the islands shortly after the first European contact. After the monarchy was overthrown and annexed by the U.S., the kingdom reverted to a set of clans of extended families.[41]

Hawaii's cultural and historical past is preserved in many locations throughout the islands. Archaeological sites are found on all of the main islands. Some sites date back as far as 700 AD, and are remnants of Hawaii's first inhabitants, Polynesian fisherman. On the Island of Hawaii, the district of Kohala in the north is the richest source of historical and cultural materials in the state. Remains of 12th century villages have been excavated along the leeward coast, while on the windward coast the Pololu Valley has remnants of 14th century agricultural settlements. In addition, the birthplace of King Kamehameha, the unifier of the Hawaiian islands, is located in this region as well. Throughout the Island of Hawaii and on the other smaller islands, there are a number of other archaeological sites. Hawaii's more modern history is preserved in historic monuments on the islands. For example, on Oahu, many tourists visit Pearl Harbor and its museums and memorials.[42]

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[37] Goonan, Kathleen Ann. Green Sands in the Sunset: On the Southern Shores of the Big Island of Hawaii. Washington Post, April 3, 1994, p. E10.
[38] Hawaii Tropical Forest Recovery Task Force. 1994. Hawaii Tropical Forest Recovery Action Plan. July 1994, p. 3.
[39] Telephone interview, Mr. Nathan Napoka, State of Hawaii, Cultural Resources Division, August 18, 1997.
[40] Royte, Elizabeth. 1995. "On the Brink: Hawaii's Vanishing Species." National Geographic. September, 1995, pp. 9-37.
[41] Getches, D. H, and C.E. Wilkinson. 1986. Cases and Materials on Federal Indian Law, second edition. West Publishing Company, St. Paul, Minnesota.
[42] Department of Geography, University of Hawaii. *Atlas of Hawaii*, 2nd Edition. University of Hawaii Press (Honolulu, 1983), pp. 94-96.

3.8 Socioeconomic Environment

Residents of Hawaii are in general characterized by relatively high educational attainment, by high rates of participation in the labor force, by concentration in government and service employment, and by high family incomes. The plantation economy of the past has given way to the current retailing, service, and government-oriented economy. Gross state domestic product in 1994 was about $36 billion. Exhibit 3-1 provides a summary of the Hawaiian industrial base.

Exhibit 3-1. Gross State (Domestic) Product by Industry, 1993 and 1994

Year	*1993* *(millions, 1994 dollars)*	*1994* *(millions, 1994 dollars)*	*% 1993*	*% 1994*
Total, all industries	36,258	36,718	100.0	100.0
Farms	284	282	0.8	0.8
Agricultural services, forestry, fisheries	197	198	0.5	0.5
Mining	31	26	0.1	0.1
Construction	2,270	2,151	6.3	5.9
Manufacturing	1,089	1,128	3.0	3.1
Transportation, communication, utilities	3,493	3,475	9.6	9.5
Wholesale trade	1,372	1,414	3.8	3.9
Retail trade	3,942	4,063	10.9	11.1
Finance, insurance, real estate	8,590	8,584	23.7	23.4
Services	7,314	7,586	20.2	20.7
Federal government				
Civilian	1,696	1,745	4.7	4.8
Military	2,668	2,623	7.4	7.1
State and local government	3,314	3,442	9.1	9.4

Source: U.S. Bureau of Economic Analysis, "Comprehensive Revision of Gross State Product by Industry, 1977-1994," Survey of Current Business, June 1997, pp. 15-41, and BEA diskette tabulated by Hawaii State Department of Business, Economic Development, and Tourism.

Provisional estimates for 1996 indicate a resident population of 1,183,723, about 6.3 percent greater than the 1990 census count of 1,108,229, according the State of Hawaii Data

Book.[43] Earlier censuses reported 964,691 in 1980, 422,770 in 1940, 154,001 in 1900, and 69,800 in 1860. These estimates and census totals include members of the armed forces stationed in Hawaii and their local dependents, a group making up 9.1 percent of the resident total when last surveyed. The 1994 *de facto* population -- which included 159,200 visitors present on an average day in that year but excluded 50,200 residents temporarily absent -- was 1,287,600.

The population of the State is relatively young (the median age in 1994 was 34.2 years), and racially diversified. The major ethnic groups, based on a 1992 sample survey, were Caucasians (23 percent of the non-barracks, non-institutional population) and Japanese (20 percent). In addition, 37 percent were of mixed race, half of them part Hawaiian. There were 381,000 households in the State in 1994, with an average size of 2.99. Migration has been a major factor in the growth of the population. Between 1990 and 1994, there was a net in-migration (excluding military personnel and dependents) of 78,000, accounting for 49 percent of the total civilian population growth during that time. Immigrant arrivals in fiscal 1994 numbered 7,742, mostly from the Philippines. About 36,000 persons (many of them in the armed forces) moved to Hawaii from the mainland during 1994.

In the State of Hawaii, personal income in 1995 was $29 billion, compared with $15 billion only ten years earlier, and per capita personal income was $24,700, or 73 percent above the 1985 level. The per capita figure for Hawaii was 9 percent over the national average, reflecting in part the State's higher cost of living. The median annual income of households, based on data for 1994, was $42,000, third highest of the 50 States. In 1994, 8.7 percent of all Island residents were below the U.S. poverty level. A family expenditure survey taken in 1992 and 1993 reported that the largest items in the family budget on Oahu were housing (accounting for 31 percent of total spending), food (18 percent), and transportation (14 percent). Top wealthholders in 1989 (the most recent data available from the l990 Census) included 22,300 persons with assets of $600,000 or more.

Environmental Justice. One component of the socioeconomic environment is environmental justice. The goal of environmental justice is to avoid, or if present recognize and mitigate, disproportionate impacts on the health and environment of minority and/or low-income communities. This draft EA assumes that Native Hawaiian communities are applicable for special consideration with respect to environmental justice concerns because, increasingly, Congress has taken into account Native Hawaiian needs explicitly in legislation that might otherwise be directed only to American Indians and Native Alaskans.[44]

Exhibit 3-2 summarizes percent distribution, by race (as identified in the 1990 Census) across various household income ranges. This information is for all of the State of Hawaii. Note that $12,764 was estimated as the annual household income poverty level in 1989 for a family of four, as reported in the 1990 Census of Population and Housing, and that $17,430 represents the 1995 annual household income poverty level for a family of four in Hawaii. Both thresholds are provided for comparison with the 1990 Census data in the exhibit.

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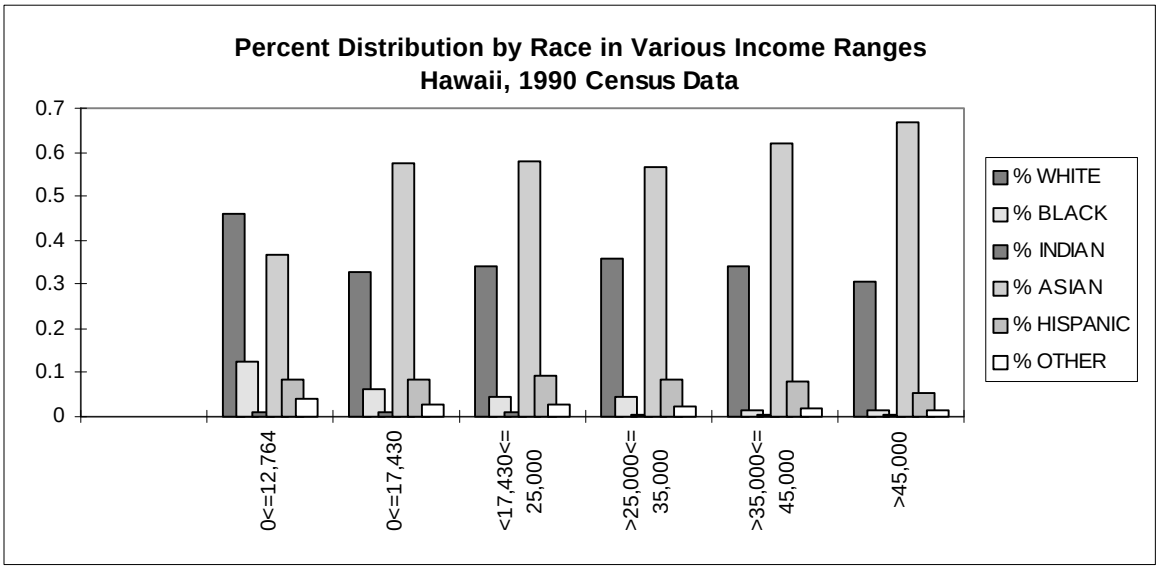
[43] 1996 State of Hawaii Databook cited over the telephone by an employee of the State of Hawaii, Department of Business, Economic Development & Tourism, August 18, 1997.

[44] Getches, D. H, and C.E. Wilkinson. 1986. Cases and Materials on Federal Indian Law, second edition. West Publishing Company, St. Paul, Minnesota.

Exhibit 3-2.



Source: 1990 Census of Population and Housing, in U.S. EPA/U.S. Department of Commerce's Lanview™ 2

Of special concern with respect to environmental justice is that much of the land in the Hawaiian islands, including wildlife that occur there, is held in trust by the government on behalf of present and future generations of Native Hawaiians. When Hawaii was annexed in 1898, the Republic of Hawaii ceded approximately 1.75 million acres of Government and Crown Lands to the United States. In 1959, Hawaii became a state, and the Government and Crown Lands were transferred to the State of Hawaii. At that point, the State of Hawaii assumed the role of trustee for these lands.[45]

The issue of ceded lands in Hawaii is extremely important and remains unresolved. Those who claim Hawaiian ancestry make up nearly 20 percent of the state's approximately 1.2 million people. Over the past decades, Native Hawaiians have actively campaigned for sovereignty. Although Native Hawaiians differ on what form self-governance should take, dozens of political factions agree on the point of control over Hawaiian land.[46]

[45] Hawaii Tropical Forest Recovery Task Force. 1994. Hawaii Tropical Forest Recovery Action Plan. July 1994, p. 3.
[46] Royte, Elizabeth. 1995. "On the Brink: Hawaii's Vanishing Species." National Geographic. September, 1995, pp. 9-37.

4. Environmental Impacts of the Proposed Action and Alternatives

4.1 Potential for Environmental Impacts of Proposed Action

Based on the fact that no changes are expected as a result of the proposed action in the number of tour operators or in the types of tour operations conducted by existing tour operators, it is assumed that there will be no impacts to the affected environment attributable to the proposed action.

Specifically, with the continuation of SFAR 71 and its safety restrictions, there should be no change in the noise levels currently experienced by Hawaiians, and no additional impacts on biological, cultural, or aesthetic resources. Introduction of exotic species would not be influenced, and neither would freshwater supplies nor the practice of traditional Hawaiian beliefs in natural environments. In fact, traditional Native Hawaiian practices and all activities by Hawaiians would continue to be protected from low-flying scenic tour operators and the potential damage from the increased risk of accidents. Similarly, the proposed action would provide some relief to wildlife, especially birds, by maintaining altitude restrictions at higher elevations. The proposed action would also protect wildlife and the Hawaiian ecosystem by maintaining increased safety requirements and thus continuing to reduce the threat of accidents that may by harmful to the ecosystem.

4.2 Potential for Environmental Impacts of the No Action Alternative

Some potential impacts on the affected environment might occur as a result of the no action alternative. These potential impacts are discussed under three possible scenarios in this subsection. In Scenario 1, existing operators modify their flight operations. In Scenario 2, existing operators increase their number of flights. In Scenario 3, new scenic tour operators enter the market, increasing the numbers of overall flights conducted. The potential environmental impacts from each of these scenarios is discussed in the following subsections.

4.2.1 Scenario 1: Existing Operators Modify Flight Operations

Under this scenario, existing scenic tour operators vary their current flight operations. Some existing scenic tour operators might maintain their operations using the expired SFAR 71 restrictions as guidelines. This might occur if there exists a consumer demand for safety standards to be maintained at the former SFAR 71 levels, and if existing operators appreciate the extra margin of safety provided by SFAR 71. The actions of operators who voluntarily maintain the SFAR 71 restrictions after it expires would have no environmental impacts.

However, some existing scenic tour operators might modify their operations and fly lower and/or use reduced stand-off distances under this scenario. This might occur if existing scenic tour operators react to a market demand for more daring and scenic flights. The actions of these operators might be expected to have potential impacts on the environment. For example, noise and privacy impacts might increase due to flight operations being conducted lower to the ground. Negative visual impacts on Hawaii's scenic vistas and cultural sites may also occur as a result of the lower flights and reduced standoff distances. Native Hawaiian religious practices might be

interfered with if more flights occur lower to the ground and with reduced standoff distances, affecting privacy and disrupting the sanctity of natural environments.

Safety could also be negatively impacted, and the increased potential for accidents might negatively impact Hawaii's water, biological, and scenic resources, depending on the type and nature of the increase in accidents. Accidents have the potential to negatively impact fresh water sources, natural flora and fauna, and/or scenic natural areas, which are the core of the tourist industry and which in many cases carry spiritual value for Native Hawaiians.

Threats to threatened and endangered Hawaiian bird species include habitat loss and degradation, the effects of introduced species, introduced predators and pathogens, and disregard of the legal protections afforded the birds.[47] The no action alternative would most likely not impact these threats. In particular, because scenic tours operators take off and land within the island ecosystem, there is not a threat of introduced species. However, native endangered and threatened nesting forest birds who are flushed from their habitats by the disruption of air tours might expect to be negatively impacted by an increase in flights conducted at reduced standoff distances and lower altitudes.

4.2.2 Scenario 2: Existing Operators Increase Number of Flights

Under this scenario, existing scenic tour operators increase the number of flights conducted relative to current baseline operations conducted under SFAR 71. This might occur if existing scenic tour operators responded to the overall reduction in regulatory restrictions and related cost burden by offering more flights, or if consumer demand increased for more daring and scenic flights.

Increasing the number of flights conducted by existing scenic tour operators might also be expected to have potential impacts on the environment. For example, noise impacts might increase due to more flights being conducted, and negative visual impacts on Hawaii's scenic vistas and cultural sites may also occur as a result of the increased number of flights. Native Hawaiian religious practices might be interfered with if more flights occur, again negatively affecting privacy and disrupting the sanctity of natural environments.

Safety could also be negatively impacted, and the increased potential for accidents might negatively impact Hawaii's water, biological, and scenic resources, depending on the type and nature of the increase in accidents. In addition, an increase in the number of flights conducted would correspondingly increase the use of airports and landing strips, fuel, and related chemicals. This could increase the minor air emissions expected from scenic tour airplanes and helicopters, and the potential for fuel-and chemical-related incidents and accidents. As stated above, without the safety restrictions imposed by SFAR 71, the potential risk of accidents increases. Accidents have the potential to negatively impact fresh water sources, natural flora and fauna, and/or scenic natural areas, which are the core of the tourist industry and which in many cases carry spiritual value for Native Hawaiians.

Threats to threatened and endangered Hawaiian bird species include habitat loss and degradation, the effects of introduced species, introduced predators and pathogens, and disregard of

[47] Ehrlich, Paul R., David S. Dobkin, and Darryl Wheye. Birds in Jeopardy: The Imperiled and Extinct Birds of the United States and Canada, Including Hawaii and Puerto Rico. (Stanford, 1992). pp 62-64.

the legal protections afforded birds.[48] The no action alternative would most likely not impact these threats. In particular, because scenic tours operators take off and land within the island ecosystem, there is not a threat of introduced species. However, native endangered and threatened nesting forest birds who are flushed from their habitats by the disruption of air tours might expect to be negatively impacted by an increase in scenic tour operations.

4.2.3 Scenario 3: New Entries in the Scenic Tour Operator Business

Under this scenario, new scenic tour operators enter the scenic tour operator business relative to the current baseline number of operators under SFAR 71. This might occur if new businesses entered the market in response to the overall reduction in regulatory restrictions and related cost and resource burden.

New entries in the scenic tour operator business would be expected to have the same potential impacts on the environment as Scenarios 1 and 2, proportionately increased by the number of new operators, the number of new flights conducted, and the types of operations conducted (e.g., to what extent the new operators take advantage of the reduced restrictions).

Again, noise impacts might increase due to more flights being conducted, and negative visual impacts on Hawaii's scenic vistas and cultural sites may also occur as a result of more flights. Safety could also be negatively impacted, and the increased potential for accidents might negatively impact Hawaii's scenic, cultural, and water and biological resources, depending on the type and nature of the increase in accidents. Similar to Scenario 2, an increase in the number of flights conducted would correspondingly increase the use of airports and landing strips, fuel, and related chemicals. This would in turn increase the minor air emissions expected from scenic tour airplanes and helicopters, and the potential for fuel- and chemical- related incidents and accidents. As stated earlier, this scenario of the no action alternative would not be expected to influence the importation of exotic species, but native endangered and threatened nesting forest birds who are flushed from their habitats by the disruption of air tours might expect to be negatively impacted by an increased number of scenic air tour flights and/or more flights conducted at lower altitudes and reduced standoff distances.

4.3 Mitigation Measures

No mitigation measures are provided, based on the conclusion that no environmental impacts are expected as a result of the proposed action.

4.4 Cumulative Impacts

No cumulative impacts are discussed, based on the conclusion that no incremental environmental impacts are expected as a result of the proposed action.

[48] Ehrlich, Paul R., David S. Dobkin, and Darryl Wheye. Birds in Jeopardy: The Imperiled and Extinct Birds of the United States and Canada, Including Hawaii and Puerto Rico. (Stanford, 1992). pp 62-64.

5. Summary

As presented in Chapter 4 of this draft EA, no incremental or cumulative environmental impacts are expected as a result of the proposed action.

However, environmental impacts are possible from any of the three hypothesized scenarios under the no action scenario (i.e., current scenic tour operators conduct more flights; current scenic tour operators conduct less restrictive tours; and new scenic tour operators enter the market and conduct less restrictive tours).

Under the no action alternative, noise impacts might increase due to more flights being conducted and/or more flights being conducted at lower altitudes and reduced standoff distances. Negative visual impacts on Hawaii's scenic vistas and cultural sites may also occur as a result of an increase in the total number of scenic tour operator flights and/or more flights being conducted at lower altitudes and reduced standoff distances.

Safety would also be decreased, and the increased potential for accidents might negatively impact Hawaii's scenic, cultural, and water and biological resources, depending on the type and nature of the increase in accidents. An increase in the number of flights conducted would also correspondingly increase the use of airports and landing strips, fuel, and related chemicals. This would in turn increase the minor air emissions expected from scenic tour airplanes and helicopters, and the potential for fuel-and chemical-related incidents and accidents.

Finally, native endangered and threatened nesting forest birds who are flushed from their habitats by the disruption of air tours might expect to be negatively impacted by an increased number of scenic air tour flights and/or more flights conducted at lower altitudes and reduced standoff distances.

6. Consultation and Coordination

The following organizations or individuals contributed verbal or other information for the preparation of the Draft Environmental Assessment for the Extension of Special Federal Aviation Regulation 71.

FEDERAL AGENCIES

FAA Honolulu Flight Standards District Office

STATE OF HAWAII AGENCIES

Activities Owners Association of Hawaii
Hawaii Chamber of Commerce
Hawaii Department of Commerce
Hawaii Department of Transportation
Hawaii Helicopter Association
Hawaii State Board of Tourism
Hawaii Visitor's Bureau
State of Hawaii, Cultural Resources Division
State of Hawaii Department of Business, Economic Development, and Tourism

PRIVATE COMPANIES

Air Kauai Helicopter Tours
Bali Hai Helicopter Tours
Big Island Air
Blue Hawaiian Helicopters
Hawaii Helicopters
Paragon Ait
Rainbow Pacific Helicopters

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